PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

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PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Applicant's or agent's file reference 2003UR013	Date of mailing (*day/month/year*) 09 FEB 2005 **FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date (*day/month/year*)	Priority date (*day/month/year*)
PCT/US04/01599	20 January 2004 (20.01.2004)	31 March 2003 (31.03.2003)

International Patent Classification (IPC) or both national classification and IPC

IPC(7): E21B 43/08 and US Cl.: 166/236, 235, 227, 230

Applicant

EXXONMOBIL UPSTREAM RESEARCH COMPANY

1. This opinion contains indications relating to the following items:

- ☒ Box No. I — Basis of the opinion
- ☐ Box No. II — Priority
- ☐ Box No. III — Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV — Lack of unity of invention
- ☒ Box No. V — Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI — Certain documents cited
- ☐ Box No. VII — Certain defects in the international application
- ☐ Box No. VIII — Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(*b*) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International Application No.
PCT/US04/01[redacted]

Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 6 and 43	YES
	Claims 1-5, 7-42 and 44-47	NO
Inventive step (IS)	Claims 12, 24, 25, 28, 29 and 42	YES
	Claims 1-5, 7-11, 13-23, 26, 27, 30-41 and 44-47	NO
Industrial applicability (IA)	Claims 1-47	YES
	Claims NONE	NO

2. Citations and explanations:

Please See Continuation Sheet

Supplemental Box
In case the space in any of the preceding boxes is not sufficient.

V. 2. Citations and Explanations:

Claims 1-5, 7-11, 13-23, 26, 27, 30-41 and 44-47 lack novelty under PCT Article 33(2) as being anticipated by Lowry et al., US 5,318,119.

Regarding claims 1, 36 and 44 , Lowry et al. discloses in figures 1-22 a wellbore apparatus comprising: a first flow joint (S1) in a wellbore, the first flow joint comprising at least one three-dimensional surface defining a first fluid flow path (44a) through the wellbore, at least one section (42) of the first flow joint surface being permeable and at least one section (94) of the first flow joint surface being impermeable. Lowry et al. discloses a second flow joint (S2) in a wellbore, the second flow joint comprising at least one three-dimensional surface defining a second fluid flow path (44a) through the wellbore, at least one section (42) of the second flow joint surface being permeable and at least one section (94) of the second flow joint surface being impermeable. Lowry et al. discloses at least one permeable section of the first flow joint is connected to at least one permeable section of the second flow joint thereby providing at least one fluid flow path between the first flow joint and the second flow joint.

As to claim 2, Lowry et al. discloses the first and second flow joints are selectively perforated basepipes (44).

As to claim 3, Lowry et al. discloses the first flow joint (S1) is adjacent to the second flow joint (S2) in the wellbore.

As to claim 4, Lowry et al. discloses the first flow joint is concentric to the second flow joint in the wellbore.

As to claim 5, Lowry et al. discloses at least one flow joint comprises joints (58,44) of pipe.

As to claim 7, Lowry et al. discloses the joints of pipe (58,44) are connected using flexible joints (60,62).

As to claim 8, Lowry et al. discloses the three-dimensional surface of the first and second flow joints are cylindrical.

As to claim 9, Lowry et al. discloses at least one wellbore annuli (12,14) is utilized as a flow joint.

As to claim 10, Lowry et al. discloses at least one flow joint is a sand screen (col. 6, lines 34-51).

As to claim 11, Lowry et al. discloses in figure 20 the sand screen (106) is a wire-wrapped screen (108, 114) and the wires of the screen are wrapped at varying pitches thereby creating varying levels of permeable sections and impermeable sections.

As to claim 13, Lowry et al. discloses the apparatus is used for producing hydrocarbons (col. 5, lines 44-54).

As to claim 14, Lowry et al. discloses the apparatus is used for gravel packing (112) a well.

As to claim 15, Lowry et al. discloses at least one impermeable and at least one permeable section are each at least 7.5 centimeters long (col. 7, lines 2-8).

As to claim 16, Lowry et al. discloses at least one impermeable and at least one permeable section are each at least 15 centimeters long (col. 7, lines 2-8).

As to claim 17, Lowry et al. discloses at least one impermeable section (94) of at least one flow joint is adjacent to at least one permeable section (42) of an adjacent flow joint.

As to claim 18, Lowry et al. discloses at any cross-section location (between holes 56) of the apparatus, at least one wall of at least one flow joint is impermeable.

As to claim 19, Lowry et al. discloses at any cross-section location at least one wall of at least one flow joint is impermeable (between holes 56) and at least one wall (42) of at least one flow joint is permeable.

Regarding claim 20, Lowry et al. discloses a first selectively perforated basepipe (S1,44) inside the wellbore defining a first fluid flow path (44a) through the wellbore, with at least one section of the first selectively perforated basepipe being impermeable (94) and at least one section of the first perforated basepipe being permeable; a second selectively perforated basepipe (S2,44) inside the wellbore defining a second fluid flow path (44a) through the wellbore, with at least one section of the second selectively perforated

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basepipe being impermeable (94) and at least one section of the second perforated basepipe being permeable; wherein at least one permeable section of the first and at least one permeable section of the second basepipes are connected (via 58,62,60) to provide at least one flow path between the first and second selectively perforated basepipe.

As to claim 21, Lowry et al. discloses the basepipes are concentric.

As to claim 22, Lowry et al. discloses in figure 22 the basepipes are eccentric (with respect to 14).

As to claim 23, Lowry et al. discloses the basepipes are adjacent.

As to claim 26, Lowry et al. discloses the perforations (56) are chosen based on the relative amount of fluids that will flow through the permeable section (col. 6, lines 59-6-4).

As to claim 27, Lowry et al. discloses the wellbore annulus (14, 12) is utilized as an additional flow joint.

As to claim 30, Lowry et al. discloses the adjacent joints of pipe are connected with flexible tubes (60,62).

As to claim 31, Lowry et al. discloses at least one impermeable and at least one permeable section are each at least 7.5 centimeters long (col. 7, lines 2-8).

As to claim 32, Lowry et al. discloses at least one impermeable and at least one permeable section are each at least 15 centimeters long (col. 7, lines 2-8).

As to claim 33, Lowry et al. discloses at least one impermeable section (94) of at least one flow joint is adjacent to at least one permeable section (42) of an adjacent flow joint.

As to claim 34, Lowry et al. discloses at any cross-section location (between holes 56) of the apparatus, at least one wall of at least one flow joint is impermeable.

As to claim 35, Lowry et al. discloses at any cross-section location at least one wall (between holes 56) of at least one flow joint is impermeable and at least one wall of at least one flow joint is permeable (at 42).

As to claim 37, Lowry et al. discloses at least two separate flow paths (44a,22) in the wellbore with at least one connection (10) permitting fluid flow between the flowpaths.

As to claim 38, Lowry et al. discloses the apparatus is used for producing hydrocarbons (col. 5, lines 44-54).

As to claim 39, Lowry et al. discloses the apparatus is used for gravel packing (112) a well.

As to claims 40 and 41, Lowry et al. discloses producing hydrocarbons from the wellbore (col. 5, lines 44-54).

As to claim 45, Lowry et al. discloses producing hydrocarbons through the flow joint (col. 5, lines 44-54).

As to claim 46, Lowry et al. discloses injecting fluids into the well through the flow joints (col. 5, lines 49-53).

As to claim 47, Lowry et al. discloses wrapping the wire (114,108 at varying pitches wherein at least one section (A) of the wire wrapped screen is permeable and at least one section (60) of the wire-wrapped screen is impermeable.

Claims 12, 28 and 42 lack an inventive step under PCT Article 33(3) as being obvious over Lowry et al. US 5,318,119 in view of Meldau, US 3,556,219

As to claims 12, 28 and 41 Lowry et al. discloses gravel packing the wellbore. Lowry et al. does not disclose at least one shunt tube in at least one flow joint. Meldau teaches use of a shunt tube (11) to provide an alternate fluid path. It would have been obvious to one having ordinary skill in the art at the time of the invention to arrange for the flow joints disclosed by Lowry et al. to have a shunt tube, as taught by Meldau to provide an alternate flow path since the use of shunt tubes is well known in the art.

Claims 24, 25 and 29 lack an inventive step under PCT Article 33(3) as being obvious over Lowry et al. US 5,318,119 in view of Fast, US, 4,064,938

As to claims 24 and 25, Lowry et al. does not disclose at least one concentric nor eccentric basepipe is larger than at least one concentric nor eccentric basepipe and further comprising at least one additional wall inside the larger basepipe to provide at least one additional flow path inside the outer basepipe. Fast teaches in figure 2 use of at least one concentric nor eccentric basepipe 16) being larger than at least one concentric nor eccentric basepipe (10) and further comprising at least one additional wall (18) inside the larger basepipe to provide at least one additional flow path inside the outer basepipe to deflect the stream of fluid entering the wellbore thereby reducing the erosion of the wire screen (col. 2, lines 24-38). It would have been obvious to one having ordinary skill in the art at the time of the invention arrange for the basepipes disclosed by Lowry et al. to be larger than at least one concentric nor eccentric basepipe and further have at least one additional wall inside the larger basepipe to provide at least one additional flow path inside the outer basepipe, as taught by Fast to extend the useful life of the wire screen.

As to claim 29, Fast teaches use of at least three flow paths (10,14,16) available through a wellbore.

Claims 6 and 43 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest the first flow joint being eccentric to the second flow joint in the wellbore, and installing a complete gravel pack during gravel packing operations after the sand screen has been mechanically damaged.